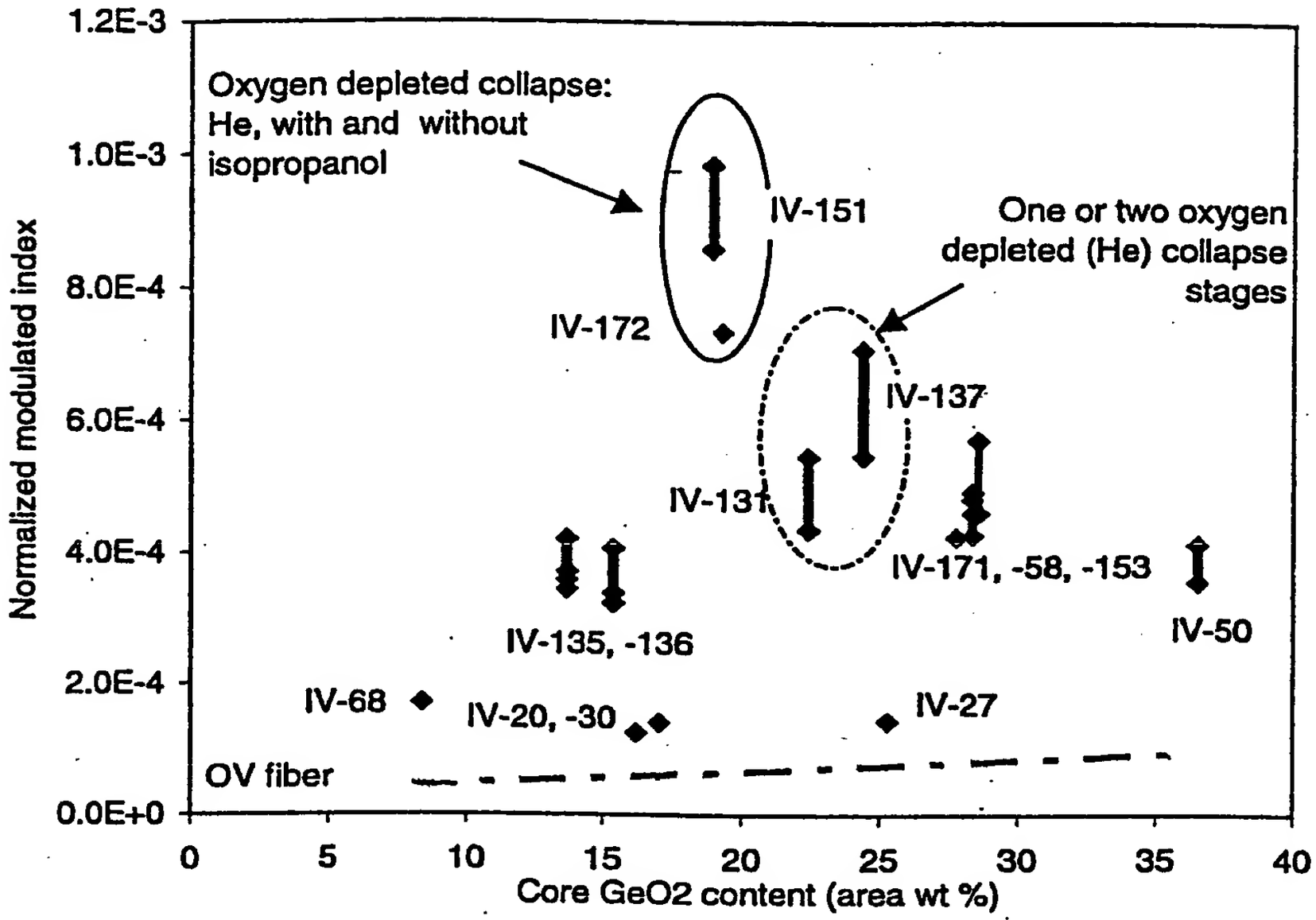
Normalized modulated index
1.2E-3
1.0E-3
8.0E-4
6.0E-4
4.0E-4
2.0E-4
0.0E+0
Oxygen depleted collapse: He, with and without isopropanol
IV-151
IV-172
One or two oxygen depleted (He) collapse stages
IV-137
IV-131
IV-171, -58, -153
IV-50
IV-135, -136
IV-68
IV-20, -30
IV-27
OV fiber
0
5
10
15
20
25
30
35
40
Core GeO2 content (area wt %)

Fig. 1

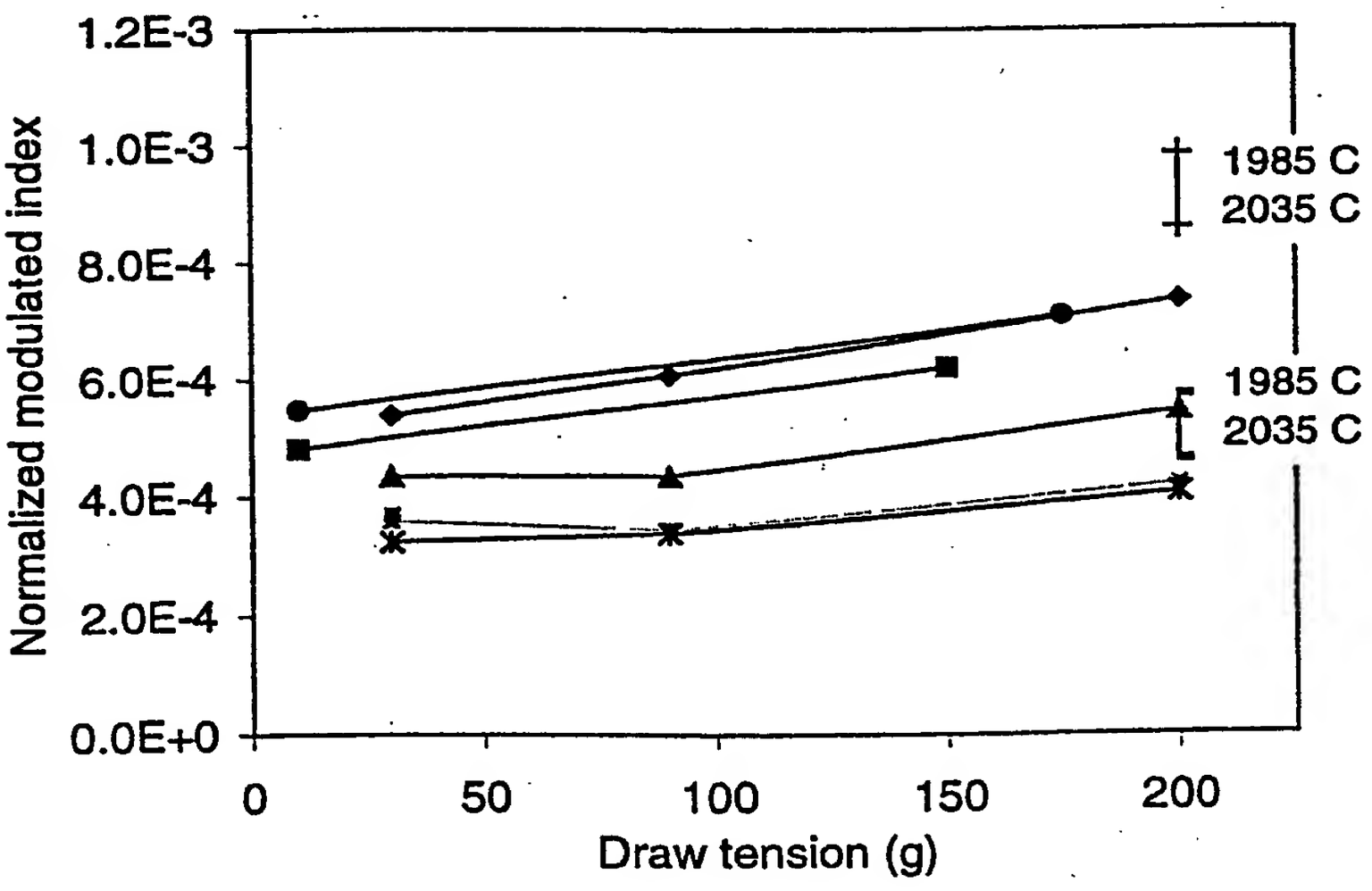
Normalized modulated index
1.2E-3
1.0E-3
8.0E-4
6.0E-4
4.0E-4
2.0E-4
0.0E+0
1985 C
2035 C
1985 C
2035 C
0
50
100
150
200
Draw tension (g)

Fig. 2

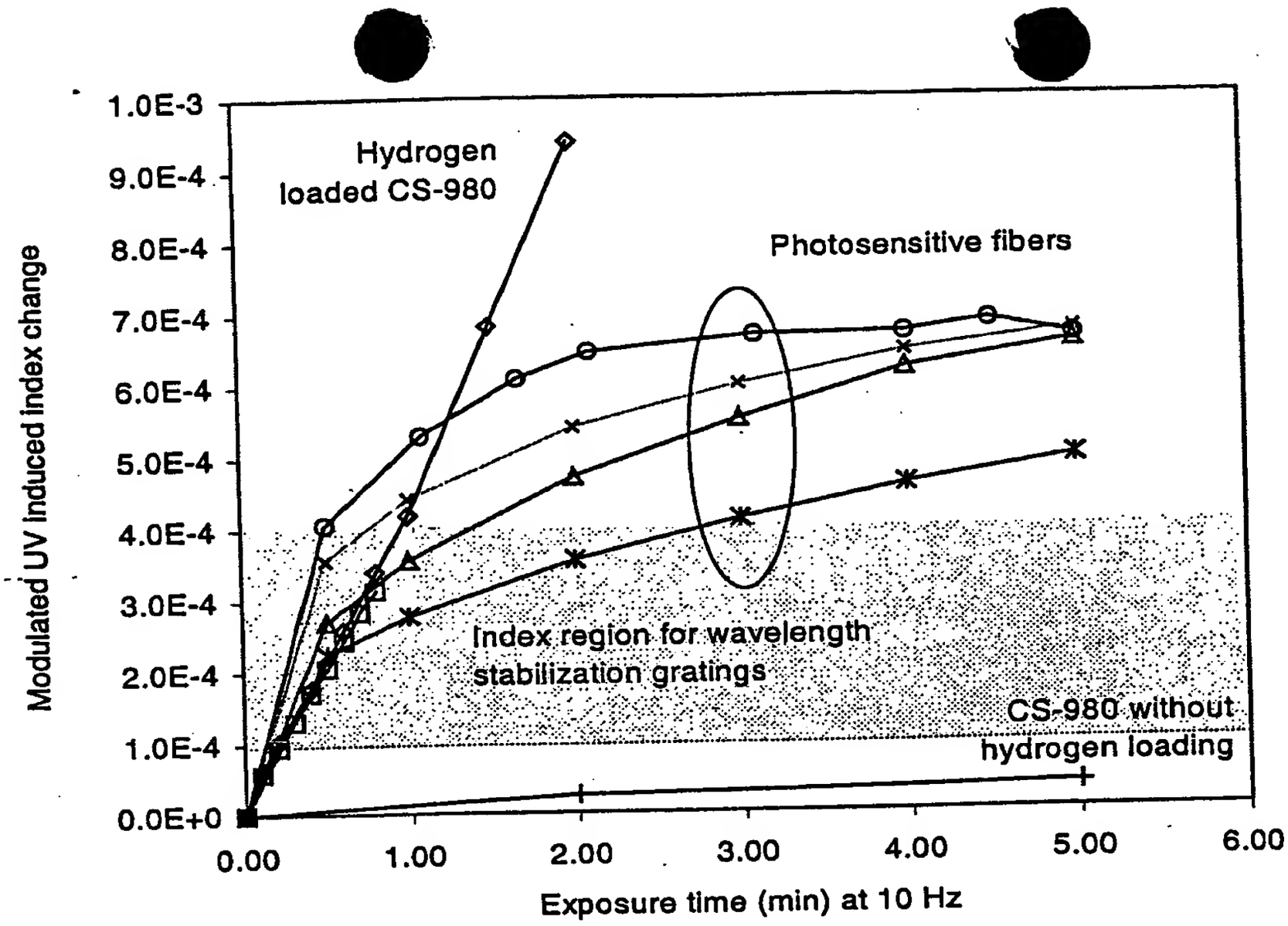
Modulated UV induced index change
1.0E-3
9.0E-4
8.0E-4
7.0E-4
6.0E-4
5.0E-4
4.0E-4
3.0E-4
2.0E-4
1.0E-4
0.0E+0
Hydrogen loaded CS-980
Photosensitive fibers
Index region for wavelength stabilization gratings
CS-980 without hydrogen loading
0.00
1.00
2.00
3.00
4.00
5.00
6.00
Exposure time (min) at 10 Hz

Fig. 3

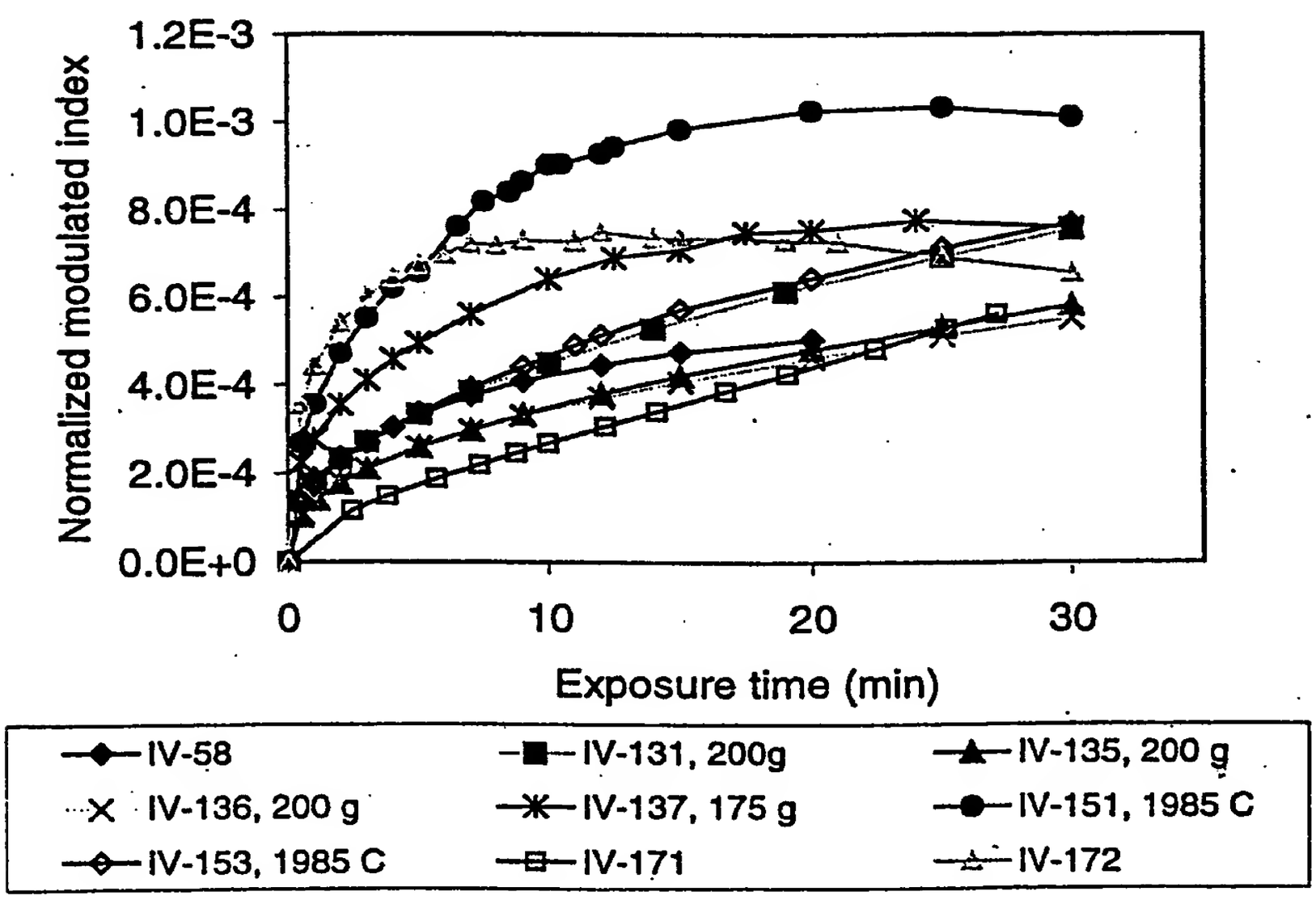
Normalized modulated index
1.2E-3
1.0E-3
8.0E-4
6.0E-4
4.0E-4
2.0E-4
0.0E+0
0
10
20
30
Exposure time (min)
IV-58
IV-131, 200g
IV-135, 200 g
IV-136, 200 g
IV-137, 175 g
IV-151, 1985 C
IV-153, 1985 C
IV-171
IV-172

Fig. 4

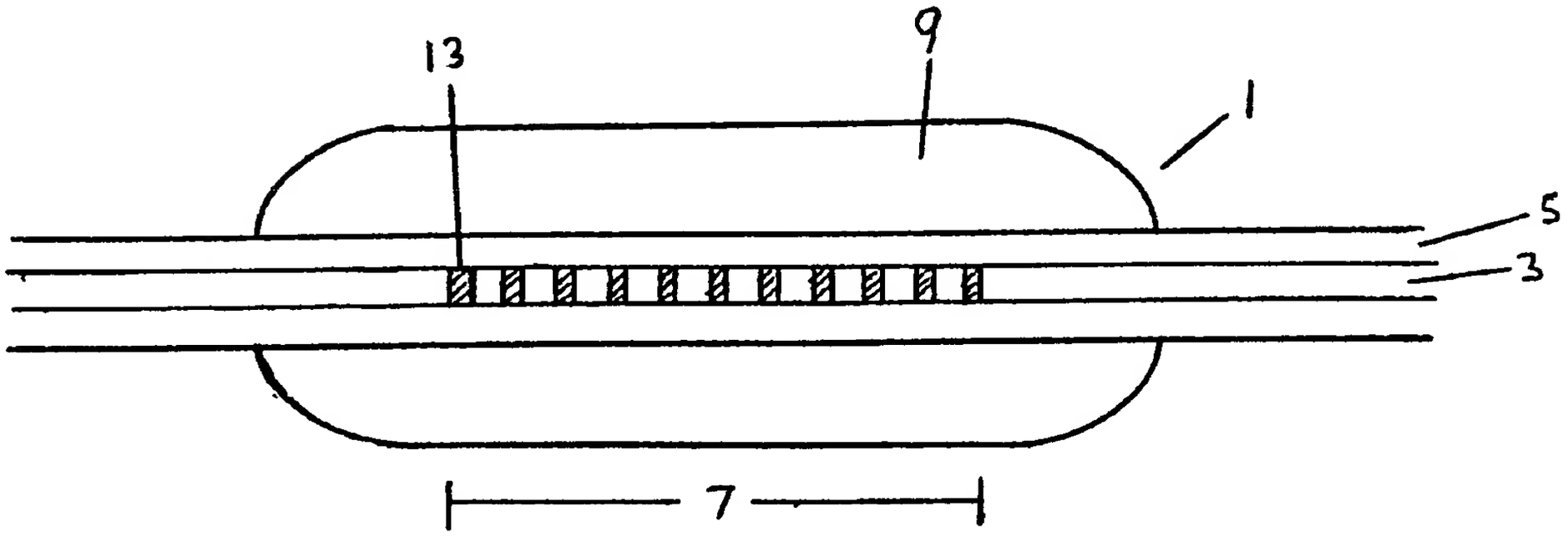

Fig. 5

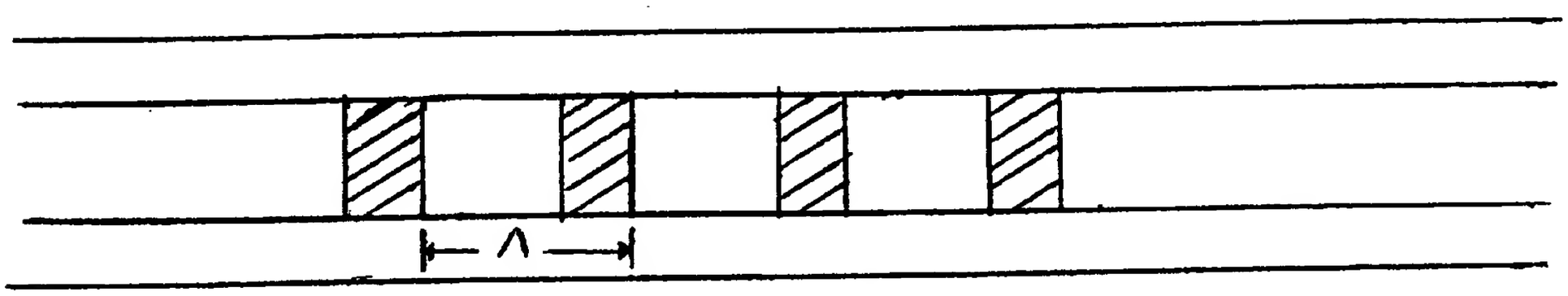

Fig. 6

Figure 7

Fiber	GeO_2	Other	Draw temp.	Draw tens.	O_2/Cl_2	$GeCl_4$	2-propanol	He	η	Growth type	15' δn_{MOD}
	(area avg., wt%)	(area avg., wt%)	(C)	(g)	300/50 sccm	50-280 sccm		300 sccm			
IV-20	16.2		2035	90	•	50			0.86	Mono	$1.26\ 10^{-4}$
IV-27	25.3		2035	90	•	100			0.91	Mono	$1.44\ 10^{-4}$
IV-30	17.04		2035	90	•	100			0.91	Mono	$1.42\ 10^{-4}$
IV-46			2035	90	•	75			0.82	Mono	$*3.8\ 10^{-5}$
IV-50	36.5		2035	90	•	280			0.87	Mono	$3.6\text{-}4.1\ 10^{-4}$
IV-58	28.4		2035	90	•	280			0.87	Mono	$4.3\text{-}4.9\ 10^{-4}$
IV-68	8.40	3.7 P_2O_5	2035	90	•	50			0.59	Mono	$1.71\ 10^{-4}$
IV-131	22.40		2035	30	(1,2)	80 (1,2)		(3)	0.77	mono	$4.35\ 10^{-4}$
IV-131	22.40		2035	90	(1,2)	80 (1,2)		(3)	0.77	mono	$4.36\ 10^{-4}$
IV-131	22.40		2035	200	(1,2)	80 (1,2)		(3)	0.77	mono	$5.46\ 10^{-4}$
IV-135	13.67		2035	30	•	•			0.76	mono	$3.72\ 10^{-4}$
IV-135	13.67		2035	30	•	•			0.76	mono	$3.59\ 10^{-4}$
IV-135	13.67		2035	90	•	•			0.76	mono	$3.45\ 10^{-4}$
IV-135	13.67		2035	200	•	•			0.76	mono	$4.22\ 10^{-4}$
IV-136	15.35		2035	30	•	•	• RT		0.84	mono	$3.24\ 10^{-4}$
IV-136	15.35		2035	90	•	•	• RT		0.84	mono	$3.39\ 10^{-4}$
IV-136	15.35		2035	200	•	•	• RT		0.84	mono	$4.07\ 10^{-4}$
IV-137	24.40		2035	10	(1)	(1)80	(2,3)50 C	(2,3)	0.79	mono	$5.48\ 10^{-4}$
IV-137	24.40		2035	175	(1)	(1)80	(2,3)50 C	(2,3)	0.79	mono	$7.08\ 10^{-4}$
IV-151	18.96		1985	200				•	0.76	mono	$9.85\ 10^{-4}$
IV-151	18.96		2035	200				•	0.76	mono	$8.60\ 10^{-4}$
IV-153	28.60		1985	200	•		• 67 C		0.81	mono	$5.72\ 10^{-4}$
IV-153	28.60		2035	200	•		• 67 C		0.81	mono	$4.62\ 10^{-4}$
IV-171	27.80		2035	90	•		• 60 C		0.81	mono	$4.26\ 10^{-4}$
IV-172	19.30		2035	90			• 75 C		0.79	slow IIA	$7.34\ 10^{-4}$

Fiber parameters for the GeO_2 doped MCVD fibers tested. Dopant concentrations are area weight averages. Core overlap integrals are calculated based on an estimated step index profile. Ranges indicate that more than one measurement was carried out on samples of the same fiber. *DC index, modulated index too weak to measure.

Figure 8

Fiber	GeO_2	Other	Draw temp.	Draw tens.	O_2/Cl_2	$GeCl_4$	2-propanol	He	η	Growth type	15' δn_{MOD}
	(area avg., wt%)	(area avg., wt%)	(C)	(g)	300/50 sccm	50-280 sccm		300 sccm			
IV-60	13	3.4	2035	90	•	280			0.91	mono	$4.93\ 10^{-4}$
IV-69	16.1	8.8	2035	90	•	150			0.91	mono	4.7-5.1 10^{-4}
IV-76	18.1	8.1	2035	90	•	•			0.80	mono	$5.76\ 10^{-4}$
IV-81	12.8	10.8	2035	90	•	•			0.59	mono	$7.09\ 10^{-4}$
IV-82	13	10	2035	90	•	•			0.74	mono	$5.59\ 10^{-4}$
IV-83	11.9	11.4	2035	90	•	90			0.43	mono	$9.24\ 10^{-4}$
IV-106	20.5	12.7	2035	90	•	90			0.80	mono	2.7-4.4 10^{-4}
IV-108	23.7	14.8	2035	90	•	80			0.75	IIA	5.7-6.6 10^{-4}
IV-118	21.78	16.31	2035	?	•	81			0.87	IIA	3.9-4.1 10^{-4}
IV-118	21.78	16.31	2035	30	•	81			0.87	IIA	$5.38\ 10^{-4}$
IV-118	21.78	16.31	2035	90	•	81			0.87	IIA	$6.07\ 10^{-4}$
IV-118	21.78	16.31	2035	200	•	81			0.87	IIA	$7.35\ 10^{-4}$
IV-125	24.60	18.10	2035	10	•	280			0.88	IIA	$4.81\ 10^{-4}$
IV-125	24.60	18.10	2035	150	•	280			0.88	IIA	$6.20\ 10^{-4}$
IV-163	17.60	17.40	2035	90	•	280		•	0.83	IIA	$3.68\ 10^{-4}$
IV-164	18.00	19.20	2035	90			• 60 C	•	0.81	IIA	$4.66\ 10^{-4}$
CMS fibers											
IV-122 ()=clad	21.40 (4.58)	4.00 (21.43)	2035	90	•	•			1.00	mono	$3.04\ 10^{-4}$
IV—168 ()=clad	21.50 (10.59)	14.60 (26.54)	2035	90	•	•			1.00	slow IIA	$6.86\ 10^{-4}$

Fiber parameters for the GeO_2-B_2O_3-doped MCVD fibers tested. Dopant concentrations are area weight averages. Core overlap integrals are calculated based on an estimated step index profile. Ranges indicate more than one measurement on samples from the same fiber.